

PTO 06-6490

CY=JA DATE=19860716 KIND=A  
PN=61-156809

DEVICE FOR JETTING VAPOR OF MELTED SUBSTANCE  
[Yoyu Busshitsu No Joki Funshutsu Sochi]

Eisaku Mori, et al.

*Yamanishi?*

UNITED STATES PATENT AND TRADEMARK OFFICE  
Washington, D.C.

August 2006

Translated by: FLS, Inc.

PUBLICATION COUNTRY	(19) :	JP
DOCUMENT NUMBER	(11) :	61156809
DOCUMENT KIND	(12) :	A
PUBLICATION DATE	(43) :	19860716
PUBLICATION DATE	(45) :	
APPLICATION NUMBER	(21) :	59275421
APPLICATION DATE	(22) :	19841228
ADDITION TO	(61) :	
INTERNATIONAL CLASSIFICATION	(51) :	H01L 21/203; C23C 14/26
DOMESTIC CLASSIFICATION	(52) :	
PRIORITY COUNTRY	(33) :	
PRIORITY NUMBER	(31) :	
PRIORITY DATE	(32) :	
INVENTOR	(72) :	MORI, EISAKU; YAMANISHI, KEN' ICHIRO
APPLICANT	(71) :	MITSUBISHI ELECTRIC CORP.
TITLE	(54) :	DEVICE FOR JETTING VAPOR OF MELTED SUBSTANCE
FOREIGN TITLE	[54A] :	YOYU BUSSHITSU NO JOKI FUNSHUTSU SOCHI

## **Specifications**

### **1. Title of the Invention**

DEVICE FOR JETTING VAPOR OF MELTED SUBSTANCE

### **2. Claim(s)**

(1) A jetting device having a crucible with a jetting orifice for jetting the vapor of a substance and a heating means which heats this crucible; said device for jetting the vapor of a melted substance characterized by being provided with a shielding material arranged opposite the above-mentioned jetting orifice above a portion for accommodating the melted substance.

(2) The device for jetting the vapor of a melted substance of Claim 1 characterized by the above-mentioned shielding material being placed detachably on the stepped portion on inner wall of the crucible above the above-mentioned accommodation portion.

(3) The device for jetting the vapor of a melted substance of Claim 1 or 2 characterized by the above-mentioned shielding material having a gap between the above-mentioned crucible and the inner wall.

### **3. Detailed Specifications**

(Field of Industrial Application)

This invention relates to a device for jetting the vapor of a melted substance to jet the vapor of a melted substance through the jetting orifice.

(Prior Art)

A vapor jetting device, as shown in the publication of JP S54-9592 was used in the past in vacuum vapor deposition for forming a thin film by heating a substance to evaporate it and form a thin film vapor deposited

on a material to be vapor deposited.

1 in Fig. 3 is a crucible; 2 is a heating means comprising a filament surrounding this crucible 1; 3 is a cover for the crucible 1; and 3a is a jetting orifice.

If the substance stored in the crucible 1 is heated to an extremely high temperature by the heating device 2 in this device, the vapor produced in the crucible 1 increases the pressure inside the crucible 1 and it is jetted from the jetting orifice 3a.

(Problems to be Solved by the Invention)

However, the conventional device is constituted as described above; hence, when the vapor is jetted through the jetting orifice 3a, the melted substance anchors to the jetting orifice 3a as it bumps and the orifice diameter narrows, while the shape of the hole changes. When used as a thin film vapor deposition device, there was a drawback because the required vapor deposition characteristics were not obtained.

This invention was accomplished to eliminate the drawbacks of the above-mentioned conventional device, and provides a device for jetting the vapor of a melted substance with the ability to prevent deformation of the jetting orifice of the crucible.

(Means for Solving the Problems)

The device for jetting the vapor of a melted substance pertaining to this invention is provided with a shielding material opposite the jetting orifice above the portion accommodating the melted substance.

(Effects)

In this invention, since the shielding material was provided opposite the jetting orifice of the crucible above the portion accommodating the melted substance, the bumped melted substance is obstructed by this shielding material from reaching the jetting orifice.

(Practical Examples)

A practical example of the present invention will now be described with reference to the drawings.

Figure 1 is the device for jetting the vapor of a melted substance in a practical example of this invention. The same reference symbols in Figure 3 denote the same or equivalent parts in Fig. 1. 4 is a shielding material arranged opposite a jetting orifice 3a, which is placed on the stepped portion 1b of the crucible inner wall above the portion 1a accommodating the melted substance. This shielding material 4 comprises a rectangular plate-shaped body, and is the size of a gap 5 between the inner wall of the crucible 1 and the two top and inferior surface in Fig. 1(b).

The effects and advantages are described next.

When the substance melted in the portion 1a accommodating the crucible 1 bumps in this device, the melted substance thus bumped is obstructed by the shielding material 4 from reaching the jetting orifice 3a. Consequently, the jetting orifice 3a is not deformed and the required vapor deposition characteristics are obtained with the thin film vapor deposition device.

In addition, since the gap 5 is provided on both sides of this shielding material 4, the vapor of the substance is not impeded by the shielding material 4. Moreover, the substance can be filled from the gap 5 and it is not necessary to detach the shielding material 4 during this filling. Furthermore, not only is the shielding material 4 placed on one crucible 1, but detachment thereof is very easy.

Moreover, in the above-mentioned practical example, it was shown that two 2 sides of the shielding material are supported by the inner wall of the crucible. However, four sides of this shielding material can be supported by the inner wall of the crucible, and moreover, there may be a gap 5 between the four corners of the inner wall of the crucible, thus manifesting the same advantages as the above-mentioned practical example.

#### (Advantages of the Invention)

As described above, according to the device for jetting the vapor of a melted substance pertaining to this invention, there are advantages because the shielding material was provided above the portion accommodating melted substance opposite the jetting orifice; hence, the melted substance thus bumped is prevented from anchoring to the jetting orifice, while deformation of the jetting orifice can be prevented.

#### 4. Brief Description of the Drawings

Figures 1(a) and (b) are a sectional side view and a sectional plane view of the device for jetting the vapor of a melted substance according to a practical example of this invention; Figures 2(a) and (b) are respective sectional side views of the device for jetting the vapor of a melted substance

according to another practical example of this invention; and Figure 3 is a cross section of a conventional device.

3a: jetting orifice; 1: crucible; 2: filament (heating means); 1a: accommodation portion; 4: shielding material; 1b: stepped portion of crucible inner wall; 5: gap

Moreover, the reference symbols that are the same in the drawings denote the same or equivalent parts.

Figure 1

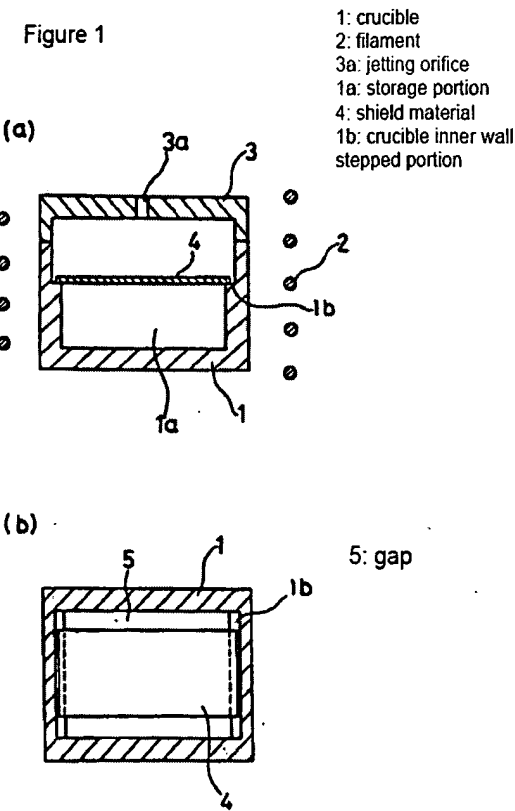


Figure 2

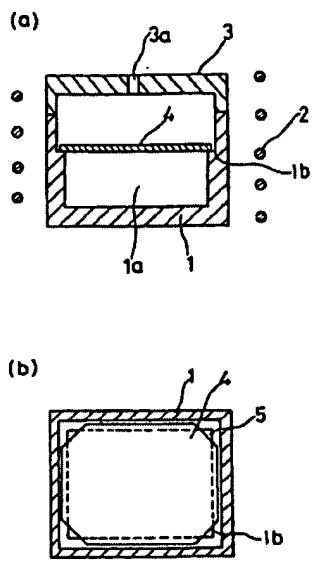


Figure 3

